RESEARCH PROBLEM STATEMENT #TS-514

I – Problem Title
Generating Real Time Loop Diagnostics and Travel Times from Existing Field hardware (2004Mob.30)

II – Research Problem Statement
Operations currently does not have a deployed methodology to either remotely diagnose, in real time, loop stations problems or to use existing loop station hardware to generate valid travel time. This reduces the effectiveness of the TMC and impedes credibility with MPOs and outside agencies. However, prior research projects have successfully field tested methods for both at the Berkeley Highway Lab (BHL) on I-80. This is a request to take the research to the next level and conduct preliminary field deployment in other areas statewide.

III – Objective
Deploy the travel time and loop diagnostic methodology previously developed in District 4 on I-80 across other freeway sections and evaluate the effectiveness (e.g. "stage 4" deployment).

IV – Background
The real or "true" station-to-station travel time for a section of I-80 has been online for many years. This true travel time is more accurate and a better indicator of incidents than the "point speed extrapolated across a distance" more commonly used by Caltrans, which is especially invalid going into or coming out of congestion. This generation of true travel time requires accurate working detectors, so a method of real time diagnostics and calibration was needed and developed.

Currently, this "BHL" method has not been applied outside of this 4-mile test section. Some minor modifications are necessary to allow for freeway geometries other than 5 lanes, but the methodology should be applicable across most of Caltrans. It requires no additional hardware other than what is in the cabinet, although all hardware must actually be working to current Caltrans Specifications.

VI – Statement of Urgency and Benefits
Somewhat urgent to leverage progress on current project. The department is committed to getting a large percentage of our billion dollar sunk cost in loop stations operational so that they can be used effectively for demand management functions. Benefit: This "BHL" method represents the least capital-intensive way of extracting more accurate and useful information from existing loop stations, requiring no additional hardware.

VII – Related Research
Numerous Path reports on the BHL methodologies are available.

VIII – Deployment Potential
Significant. This is the only proven technology for extracting travel time, incidents, and diagnostics from loop stations with no additional hardware, and Caltrans owns it.